

Alpine Laboratory
Manitou, Colo.
Aug 24, 1919.

Dear Dr. Mung:-

Today I am perched high up on an uncomfortable mountain side above camp where I am taking hourly readings in humidity, temperature and light. We have a transect established here at the Lab that cuts the cañon and on special days we all go to the stations on the transect and spend 14 hours there making readings of instruments. The idea of the whole proposition is to try and determine why the slope vary in their woody flora. for example why the oak scrub appears in isolated colony on the south slope which is otherwise covered with Yellow Pine & Lumber Pine and why Engelmann spruce supplant Douglas Fir along the lower portion of the north slope. In other words we are trying to get actual figures which can prove & disapprove the Life Zone concept.

Well I guess I have jumped into about the middle of my story but I will retrace my steps and start at the beginning. The Alpine Lab is situated on the C. & N. RR up Pikes Pk at the station called Meinschaha at 8300 ft alt. We are at the lower edge of the Canadian Zone but most of the forest immediately adjacent are Pseudotsuga and Yellow and Lumber Pine hence type Transition

There are 10 of us here and certainly it is a swell bunch of people. The chief work carried on this summer is that of the Phytometers. I think I told you about them when I was in Clement. They are simply plants grown in standard soils sealed thus eliminating the soil factor. There is a station on the Plains below Colorado sp. w., One here at Minnehaha and a subalpine station higher up in the mts. It takes lots of work to keep these stations going and so half the people up here are assisting with that work. They compare the leaf surface gain in wt. photosynthetic manufacture of the plants in all these stations and thus draw their conclusions of course there are atmometer & hydro-thermograph readings to go with each station. I was lucky enough however to get out of the ~~atmo~~ phytometer work for I became Dr. Hall's personal assistant and have worked almost wholly on the transplanting work. I think I told you that Dr. Hall was working on a "Major species" idea and that he was going to jump till he could draw a well cut limit around a species and then indicate the variations in that group (which we would usually give full specific rank) ^{as} ~~as~~ varieties or "minor species". In two or three years he & Clements are to put out a big quadruple monograph of Atriplex, Artemisia, Haplopappus and Chrysothamnus in which

the truth much, if any when I say that I know
fully 90% of the flora on the Peak. Next year
we are to work more out on the plains which
is, to me, a very interesting piece of country with
so many new genera and species for me to get
acquainted with. I have been down to the plain
a good many times but most of my work has
been in Canadian, Hudsonian and Arctic alpine zones.
I have been up above timber line ~~many times~~
a great many times. Dr. Hall and I camped for
4 days at Windy Point which is at 12,000 ft alt.
and had a wonderful time. It was hard for
me to realize that I was so high for the
weather was glorious and the meadow around our
tent was carpeted with alpine flowers for all
the world like some large pasture. Rydberg
certainly has chopped up the species to a fine
point and really it is hard to see what the
man means, in lots of cases, for his separating
differences are so minute. Nelson is better & more
usable but is full of lots of errors. The Flora of
Rydberg is very helpful as it gives localities
but Rydberg has changed his mind a lot since
that was written so that lots of times we get
a different name out of Nelson & the two books
Rydberg. I am beginning to see why the reactionary
spirit is so well developed here in Colo & the

they set forth & illustrate the major-minor species principle and a discussion of criteria used in classification species making. This last point is to be enlarged upon in a subsequent monograph on the subject and based upon largely our transplant work. We find reciprocal pairs of species differing in one or more minor points. We take 5 plants of one of the pair and plant them in the holes out of which we have dug 5 plants of the remaining half of the pair which are planted in the holes of the first half. These are staked, herbarium & liquid material & full notes taken. We have also brought down a complete representation of the alpine flora and planted it in 3 different gardens, a bare gravel ridge, a sunny grassy hillside and a creek bank. In all we have moved nearly 700 plants. We hope to get a rise out of a good many of them. I am to come back here again next year and it now looks as tho I would be here summers for several years to come. I certainly have had a wonderful time here in Colorado and I have had the chance of a life time to get acquainted with the flora of this region as I have had to study the flora carefully in order to locate reciprocal transplant material. Working with a flora every day for $2\frac{1}{2}$ months certainly ought to make me remember a few plant names and I am not stretching

Rocky Mt. Region.

I leave for school, which has been going since the 19th of Aug, on the 31st getting into Berkeley the evening of the 3rd. I obtained leave of absence so I don't expect much trouble getting into school late. We didn't make many collections but whenever we did we put up 4 sheets, one for U.C., one for Torrey, one for the Academy of Sciences, and one for the Institute. I think there will be about 50 specimens, a lot of them being grasses & sedges. I have some lichens also for the collection at Claremont and will bring them when I bring the other plants, at Christmas time.

I sent you the other day some plants of *Marchantia*. one collection had large cells and I thought they would be of interest because of that fact. The rest ~~had~~ was abundantly fruiting female plants and I thought they would be acceptable because good ♀ plants are rare in So. Cal.

I suppose you are now back at Chicago working on ecology. I surely hope that you come back ready to knock the spots out of that theory that Chaparral is a sub-climax.

Well I guess I had better read my instruments so I will close now until my next

Sincerely,

Ivan Johnston